

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

I. Status of the Claims

Claim 68 is requested to be cancelled.

Claims 56-59 are currently being amended to recite the term “dough” in place of the term “substance”. Support for the amendment to claims 56-59 can be found, *inter alia*, at [0087] of the corresponding U.S. Patent Application Publication for the captioned application, No. 2004/0234998. Thus, the foregoing amendment does not introduce new matter.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 56-67 and 69-70 are now pending in this application, and claims 10, 13 and 44-47 are withdrawn awaiting potential rejoinder.

II. Priority

The Examiner objected to the priority of the present application stating that only a certified copy of U.K. Application No. 9907805.7 has been filed in the parent application, 09/869,155, thus the captioned application only has a priority date of April 6, 1999. Office Action at 2-3. Applicants respectfully disagree.

First, Applicants point out that a certified copy of U.K. application no. 9828599.2, filed December 23, 1998, is part of the Image File Wrapper for parent application no. 09/869,155 accessible on the public PAIR system at the USPTO web site. Thus, the

Examiner is incorrect that Applicants only submitted a certified copy of one out of the three foreign priority applications.

Second, Applicants point the Examiner to the Office Action issued in the present application on May 19, 2006. In the Office Action, Examiner Rao indicated that acknowledgment was made of Applicants' claim for foreign priority under 35 U.S.C. § 119(a)-(d). Office Action dated May 19, 2006 at 3.

Third, Applicants point the Examiner to the Notice of Missing Requirements Under 35 U.S.C. 371 in the United States Designated/Elected Office, dated August 1, 2001, in parent Application No. 09/869,155. The Notice indicates that the USPTO has received the priority documents and that the priority date of parent Application No. 09/869,155 is December 23, 1998, the filing date of the earliest filed U.K. Application No. 9828599.2. Thus, according to the USPTO, and previous Examiner Rao, certified copies of the U.K. priority applications were previously submitted and acknowledged.

Applicants respectfully request that the Examiner withdraw the objection and acknowledge Applicants' priority under 35 U.S.C. § 119(a)-(d) to all three U.K. applications as asserted.

III. Objections to the Claims

The Examiner objected to claim 68 for allegedly "not further limiting claim 65...." Office Action at 3. Applicants respectfully traverse this objection. Solely in an effort to advance prosecution, and not acquiescing in the propriety of the objection, Applicants have canceled claim 68 without prejudice to the subject matter therein. Thus, the objection is moot.

IV. Rejections Under 35 U.S.C. § 102(b)

A. Rejection in View of Paice and Wolf

The Examiner rejected claims 56 and 58 under 35 U.S.C. § 102(b) as allegedly being anticipated by Paice *et al.* (Accession No. P18429, UnitProt Database, 1990 and *Arch.*

Microbiol. 1986, Vo. 144:201-206) (“Paice”) or Wolf *et al.* (Accession No. 140569, PIR Database, 1996 and *Microbiology*, 1995, Vol. 414:281-290) (“Wolf”). Office Action at 3-4. Applicants respectfully traverse this rejection as it applies to the amended claims.

An anticipation rejection under 35 U.S.C. § 102 requires a showing that **each limitation of a claim** is found in a single reference, practice or device. *See In re Donohue*, 766 F.2d 531 (Fed. Cir. 1985). For a reference to be anticipatory, it must “be enabling and describe the applicant’s claimed invention sufficiently to have placed it in possession of a person of ordinary skill in the field of the invention.” *See In re Paulson*, 30 F.3d (Fed. Cir. 1994). The cited references do not anticipate the present claims as they do not teach each and every element of the claims.

Claims 56 and 58 have been amended to relate to a bakery product or a dough for making a bakery product comprising a polypeptide expressed from the nucleotide sequence of SEQ ID NO:6, wherein the bakery product or dough for making a bakery product is suitable for use in a foodstuff.

The Examiner alleges that Paice or Wolf “disclose a substance i.e., polypeptide of SEQ ID NO:5 in a buffer which could be used in [the] making of a bakery product.” Office Action at 4. Applicants respectfully disagree. Neither reference teaches the enzyme in a bakery product or a dough for making a bakery product for use in a foodstuff. Paice relates to the isolation of a xylanase gene from *B. subtilis* and describes the use of a Tris-HCl buffer with a pH of 8.0 and a buffer of 0.05 Tris-HCl, pH 8.0. Paice does not disclose a bakery product or a dough for making a bakery product. Likewise, Wolf relates to the isolation of a xylanase gene from *B. subtilis* 168. Neither Paice nor Wolf discloses a bakery product or a dough for making a bakery product, let alone a bakery product or a dough for making a bakery product comprising a polypeptide expressed from the nucleotide sequence of SEQ ID NO:6, wherein the bakery product or dough for making a bakery product is suitable for use in a foodstuff, as is presently claimed.

Since neither reference teaches a bakery product or dough for making a bakery product comprising the specific xylanase encoded by the polynucleotide of SEQ ID NO:6, the

cited references cannot anticipate the present claims. Therefore, Applicants respectfully request that the rejection be withdrawn.

B. Rejection in View of Campbell

Additionally, the Examiner rejected claims 57 and 59 under 35 U.S.C. § 102(b) as allegedly being anticipated by Campbell *et al.* (U.S. Patent No. 5,405,769) (“Campbell”). Office Action at 4. Applicants respectfully traverse this rejection.

Specifically the Examiner states that Campbell “teache[s] the isolation of a *Bacillus* xylanase having 100% sequence homology to the amino acid sequence of amino acid residues 29-213 of SEQ ID NO:5 lacking the leader sequence and also suggest the use of said xylanase for altering the texture in bakery products (column 1).” Office Action at 5. Applicants respectfully disagree.

Campbell is directed to “a modified xylanase, which shows an improved thermostability when compared to the naturally occurring xylanase.” Campbell at col. 1, ll. 7-9. Campbell is further directed to “a modified xylanase, wherein said xylanase has increased thermostability and wherein said xylanase is modified through either the introduction of a non-native disulfide bridge, introduction of an N-terminal mutation, or both.” Campbell at col. 1, ll. 10-14. As such, Campbell is directed to modified xylanases, in particular xylanases of *B. circulans*. Campbell at Abstract.

The Examiner makes reference to a comment in Campbell that xylanases can be used for altering the texture in bakery products and that Campbell discloses a protein which is 100% identical to amino acids 29-213 of SEQ ID NO:5 (the Examiner does not specifically indicate which sequence of Campbell is 100% identical to amino acids 29-213 of SEQ ID NO:5). However, there is nothing in Campbell to suggest that a protein having the amino acid sequence of 29-213 of SEQ ID NO:5 can be used in a bakery product or dough for a bakery product. The Examiner points to a vague statement in the background of Campbell and attempts to combine that with the alleged disclosure of amino acids 29-213 of SEQ ID NO:5 to support an alleged teaching of a bakery product or dough for making a bakery product comprising a protein having amino acids 29-213 of SEQ ID NO:5.

Since, Campbell does not specifically teach the specific xylanase having amino acids 29-213 of SEQ ID NO:5 in a bakery product or dough for a bakery product, the cited reference cannot anticipate the present claims. Therefore, Applicants respectfully request that the rejection be withdrawn.

V. Rejections Under 35 U.S.C. § 103(a)

A. Rejection Over Haarasilta or Poutanen in view of Paice and Campbell

The Examiner rejected claims 56-66 and 68-70 under 35 U.S.C. § 103(a) for allegedly being unpatentable over U.S. Patent No. 5,176,927 to Haarasilta (“Haarasilta”) or Poutanen, K. (*Trends in Food Science and Technol.* (1997) 8:300-306) (“Poutanen”) in view of Paice and Campbell. Office Action at 5. Specifically, the Examiner alleges that it would have been “obvious to a person of ordinary skill in the art to use the xylanases of Paice et al., and Campbell et al., in baking, baking products and doughs as suggested by Haarasilta et al., or Poutanen K.” Office Action at 6. Additionally, the Examiner alleges that one of skill would have been motivated to use the xylanases of Paice and Campbell in baking products as the addition of xylanases resulted “in increasing the specific volume of wheat bread without causing stickiness.” Office Action at 6 (emphasis in original). Applicants respectfully traverse this rejection as it may apply to the amended claims.

The Supreme Court recently reaffirmed the *Graham* factors for determining obviousness in *KSR Int’l Co. v. Teleflex Inc.* (No. 04-1350) (U.S., April 30, 2007) (holding that the proper inquiry for determining obviousness is whether the improvement is more than the predictable use of prior art elements according to their established functions). Further, the Court still requires that the reasoning used to combine the elements in the fashion claimed be made explicit.

Haarasilta relates to improving the production process of cereal products in adding hemi-cellulose or cellulose degrading enzymes. Haarasilta does not teach or suggest a bacterial xylanase which is expressed from the nucleotide sequence of SEQ ID NO:6, let alone that this xylanase would be particularly useful in bakery products or dough for such bakery products.

Poutanen is a review of enzymes used to improve the quality of cereals. Poutanen discusses that the use of xylanases may increase viscosity, increase bread volume and decrease staling in bread. Poutanen at Table 3, on page 304 references two articles disclosing a particular *Aspergillus* (*i.e.*, fungal) xylanase.

Campbell relates to the production of thermostable mutants of xylanase. The main purpose of the production of these mutants is to put them to use in the pulp manufacturing industry. *See* Campbell, abstract. Only one reference in Campbell is made to a bakery use. Campbell cites Maat *et al.* (In Xylans & Xylanases Elsevier (1992) 349-354 (“Maat”)) in support of xylanase use in altering the texture of bakery products. *See* Campbell, column 1, lines 54 to 58. For the avoidance of doubt, the xylanase of Maat is, in fact, a fungal xylanase and, as will be explained below, Maat actually teaches *away* from using a bacterial xylanase in dough, as required by Applicants’ claims.

Paice has been discussed previously in the § 102 section of this reply.

1. The Cited Prior Art Teaches Away from the Claimed Invention

The Examiner provides no motivation as to why one of skill in the art would have used the specifically claimed bacterial xylanase obtained by expressing the polynucleotide sequence of SEQ ID NO:6 or the xylanase having amino acids 29-213 of SEQ ID NO:5 in the claimed bakery product or dough for use in a bakery product. At the time of the claimed invention, bacterial xylanases were known to produce very sticky doughs, as discussed in the specification at paragraphs [0010] - [0012].

References such as Maat (cited by Poutanen and cited as document **A27** in the IDS filed August 18, 2003) actually teach *away* from the use of bacterial xylanases in bakery products or doughs for bakery products, as required by the claimed invention. Specifically Maat states that the use of *Aspergillus* (fungal) xylanase is effective in “increasing the specific volume of breads, without giving rise to a negative side effect on dough handling (stickiness of the dough) *as can be observed with xylanases derived from other funga*l or *bacteria*l sources.” Maat at 349 (emphasis added).

A person of ordinary skill in the art could have selected any of the xylanases known in the art to incorporate into a bakery product or dough. Therefore, the Examiner has provided no reason why one of skill in the art would have selected a bacterial xylanase, moreover the xylanase produced by the polynucleotide of SEQ ID NO:6. Additionally, Applicants maintain that one of skill in the art would not have chosen to use a bacterial xylanase in view of the knowledge in the art that bacterial xylanases produced sticky doughs. Thus, the Examiner is relying upon hindsight to now suggest that it would have been obvious to use the xylanase obtained by expressing the polynucleotide sequence of SEQ ID NO:6 in a bakery product or dough for a bakery product.

2. Applicants' Claimed Invention Demonstrates Unexpected Results

Additionally, the present inventors discovered that the xylanase produced by the polynucleotide sequence of SEQ ID NO:6 had a surprising and unexpected effect. In particular, the claimed xylanase produced a significantly less sticky dough as compared with other xylanases, including other bacterial xylanases. *See Example 1.* In Example 1 of the present application, the Röhm bacterial xylanase (which differs from the xylanase of the present invention by only a small number of amino acids) was compared with the xylanase obtained by expression of the nucleotide sequence of SEQ ID NO:6 (referred to as BX in the captioned application). *See e.g.* Tables 2 and 4 of the specification. The results in the application demonstrated that BX gave rise to a less sticky dough compared with the Röhm bacterial xylanase.

These results also show that there was a high level of unpredictability in the art with regard to which xylanases would yield less sticky dough. Indeed, the fungal and bacterial xylanases had different effects on the stickiness of the dough produced in the specification. *See e.g.* Table 2 of the specification. Additionally, there are differences in the stickiness of dough produced by different bacterial xylanases. The xylanase produced by the polynucleotide of SEQ ID NO:6 (BX) had a different effect on the stickiness of doughs prepared as compared to another bacterial xylanase (Röhm). *See Table 3.*

Thus, the claimed invention is “more than the predictable use of prior art elements according to their established functions.” Specifically, the claims are nonobvious over the cited prior art in view of the lack of motivation in the art to have specifically chosen the claimed xylanase from all known xylanases, especially in view of the art teaching away from the use of bacterial xylanases. Moreover the claimed invention is nonobvious given the unpredictability in the art and the unexpected results that the claimed xylanase produced a less sticky dough as compared to other xylanases. The Examiner is improperly relying upon hindsight to make the rejection under § 103(a). Accordingly, Applicants respectfully request that the rejection be withdrawn.

B. Rejection Over Haarasilta or Poutanen, Paice and Campbell and further in view of Autio

The Examiner has also rejected claim 67 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Haarasilta or Poutanen, Paice and Campbell and further in view of Autio *et al.*, Academic Press, 1996, pages 18-27) (“Autio”). Office Action at 7. The Examiner states that the combination of Haarasilta, Poutanen, Paice and Campbell do not teach xylanase free of glucanase enzymes. Office Action at 7. As such, he alleges that Autio teaches “the effects of purified xylanase and glucanase on the structural and baking characteristics of doughs, said reference discloses that the addition of glucanase had a hardening effect on doughs and bakery products.” Office Action at 7. The Examiner alleges that it would have been obvious to combine the teachings of Haarasilta, Poutanen, Paice, Campbell and Autio to produce the baking products and doughs with xylanase devoid of glucanase.

For the reasons discussed above, Autio does not cure the deficiencies of Haarasilta Poutanen, Paice and Campbell. Additionally, Autio relates to the use of a purified funga (*Trichoderma reesei*) xylanase in rye doughs and the effects thereof. *See* Autio, Materials & Methods at 19. Autio does not disclose the use of a bacteria xylanase in dough, let alone a bacterial xylanase expressed from the nucleotide sequence of SEQ ID NO:6. In addition, Autio does not teach or suggest that the use of such a bacterial enzyme will give rise to a less sticky dough compared with an otherwise identical dough prepared by incorporating a fungal xylanase instead of a bacterial xylanase. Thus, Applicants respectfully request that the Examiner reconsider and withdraw the rejection.

VI. Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

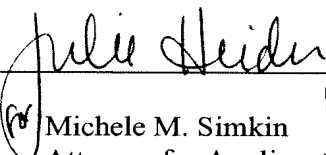
The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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